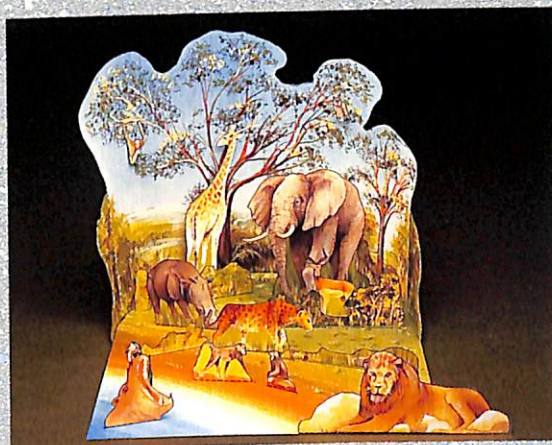


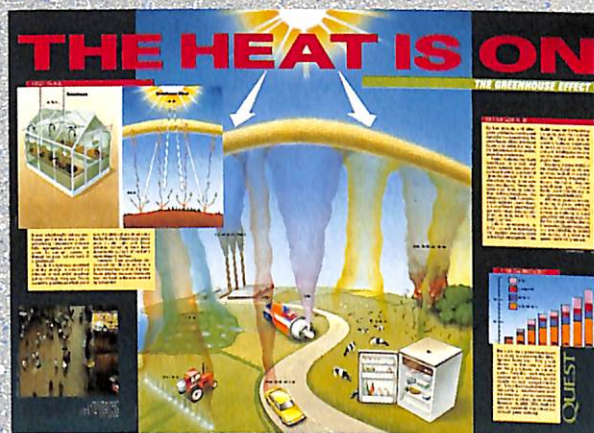
INSIDE THIS PACK

FACT FILES

- Dealing with waste
- Animals on the verge of extinction
- Smog and acid rain
- Reclaiming habitats
- How many people do we need?
- Orbiting trash

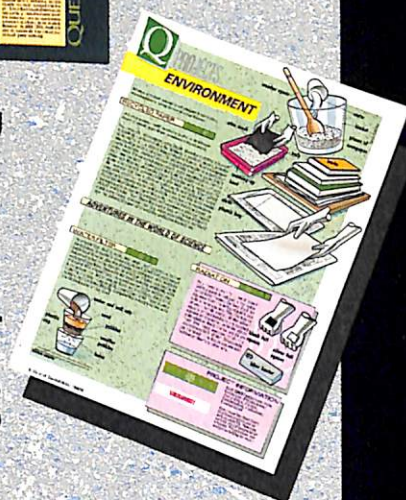


MODEL African water-hole

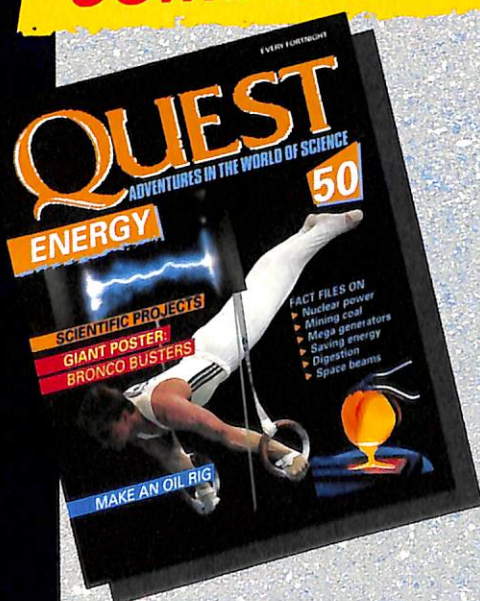


POSTER Global warming

PROJECT SHEETS



COMING IN QUEST 50 ENERGY



MODEL
Offshore oil rig

FACT FILES INCLUDE:

- The power of plants
- New fuels
- Nuclear power
- King Coal's new age
- Electric dreams
- Muscle power



POSTER
The bronco busters

ISSN 1350-3766





PROJECTS

ENVIRONMENT

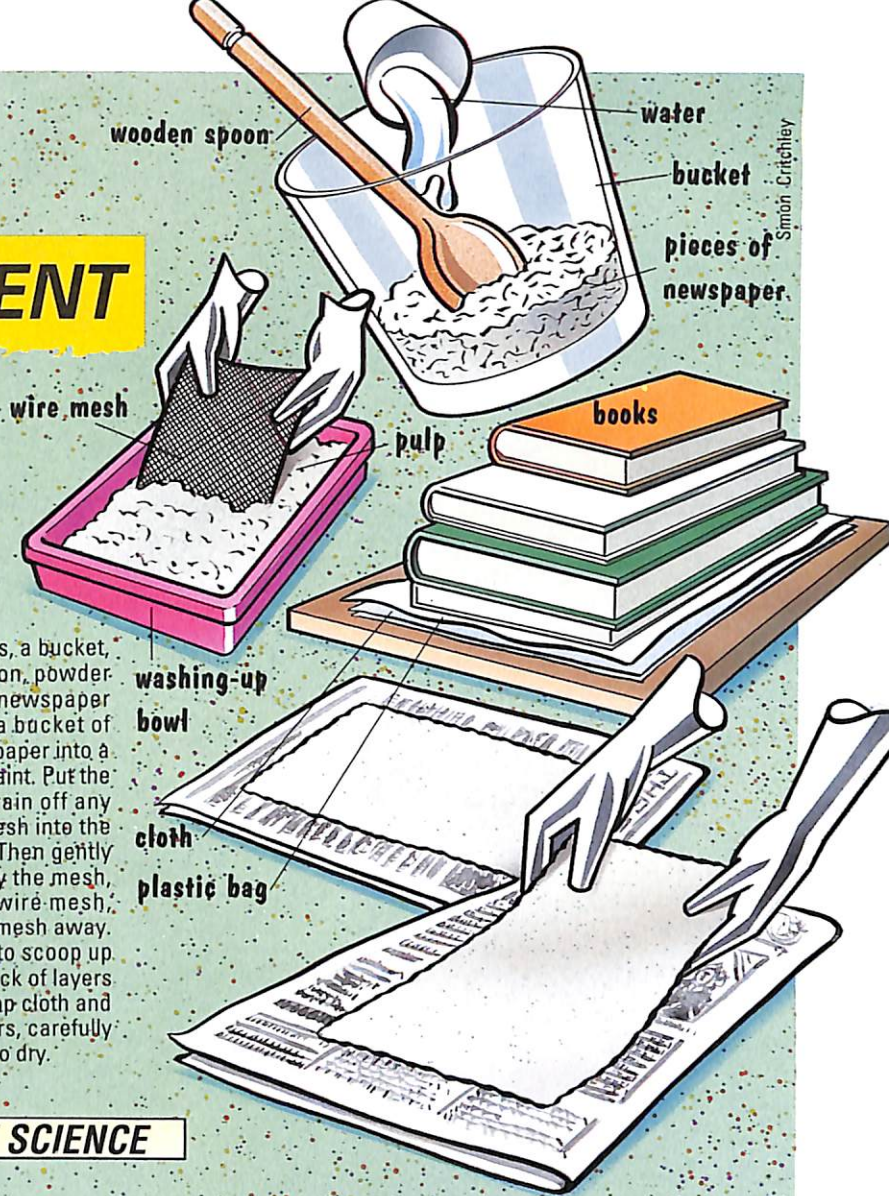
Make a fresh supply of paper from old newspapers lying around your home.

RECYCLED PAPER

1 2 3 4 5

As in a paper mill, watery pulp is drained over a mesh and then pressed into sheets.

You need old newspapers, wire mesh, absorbent cloths, a bucket, a washing-up bowl with a flat bottom, a wooden spoon, powder paint (optional), a plastic bag and some books. Tear newspaper into small pieces and soak the pieces overnight in a bucket of water. Next day, drain off excess water and mash the paper into a pulpy mass. For coloured paper, mix in some powder paint. Put the pulp into the bowl. Make sure the pulp is moist – drain off any water still floating above the paper. Slide the wire mesh into the mixture so that it is covered with a thin layer of pulp. Then gently lift the mesh out. Lay a cloth on a flat surface and lay the mesh, pulp side down on to the cloth. Press hard on the wire mesh, sponging up excess water with a cloth, then peel the mesh away. Place another cloth on top of the pulp. Use the mesh to scoop up more pulp and repeat this process until you have a stack of layers of pulp and cloths. Then place the plastic bag on the top cloth and stack some heavy books on the bag. After several hours, carefully peel the sheets of paper off the cloths and leave them to dry.

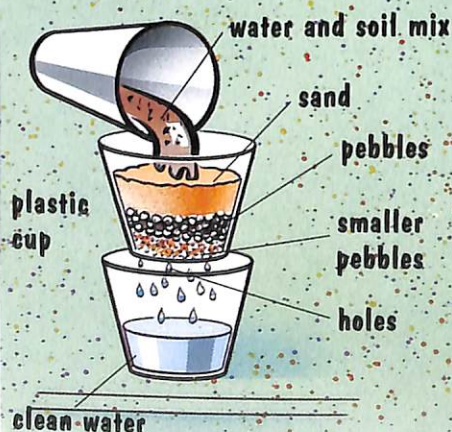


ADVENTURES IN THE WORLD OF SCIENCE

WATER FILTER

1 2 3 4 5

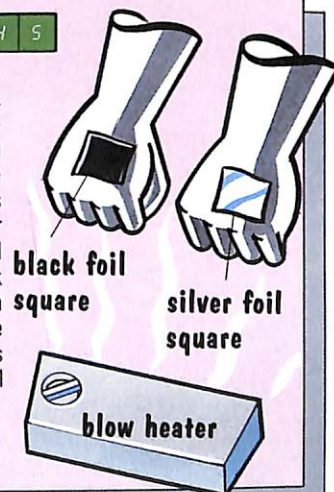
You need two plastic cups, one larger cup or bowl, a pair of compasses or dividers, some water, soil, small and very small pebbles and sand. Use the dividers or compass point to make ten small holes in the bottom of one cup. Fill the cup first with very small pebbles, then with the small pebbles and lastly with the sand. Mix the soil into the clean water in the second cup. Now place the larger cup or bowl on a solid surface and, holding the filter cup over it, pour roughly half the muddy mixture into the filter. Finally, compare the muddy mixture with the filtered water in the bowl.



RADIATION

1 2 3 4 5

You need silver foil, matt black paint, a paint brush and a hot radiator or blow heater. Cut two 2 x 2 cm squares from the foil and paint one side of one square. Wet the backs of your hands and stick the silver square on one hand and the painted square on the other, with the black side visible. Hold the hands 10 cm from the heat source, with the backs towards it. Within 30 seconds the hand with the black square will feel hotter than the other one.



PROJECT INFORMATION

1 2 3 4 5

WARNING!

Each QUEST project and model has its own difficulty rating: 1 very simple, 2 simple, 3 intermediate, 4 advanced, 5 complicated.

Every care has been taken to ensure projects are as safe as possible. However, parents should supervise all projects. The publisher can accept no liability for injury.



MODEL

ASSEMBLY INSTRUCTIONS

1 2 3 4 5

You will need

Scissors • Ruler • Craft knife • Glue

Before cutting out the pieces, score along all broken lines with a blunt edge and ruler to make folding and gluing easier. Study the ASSEMBLY DIAGRAM to see how the pieces fit together, and use the dotted lines as a guide for positioning.

NB Younger children will need supervision when using a craft knife.

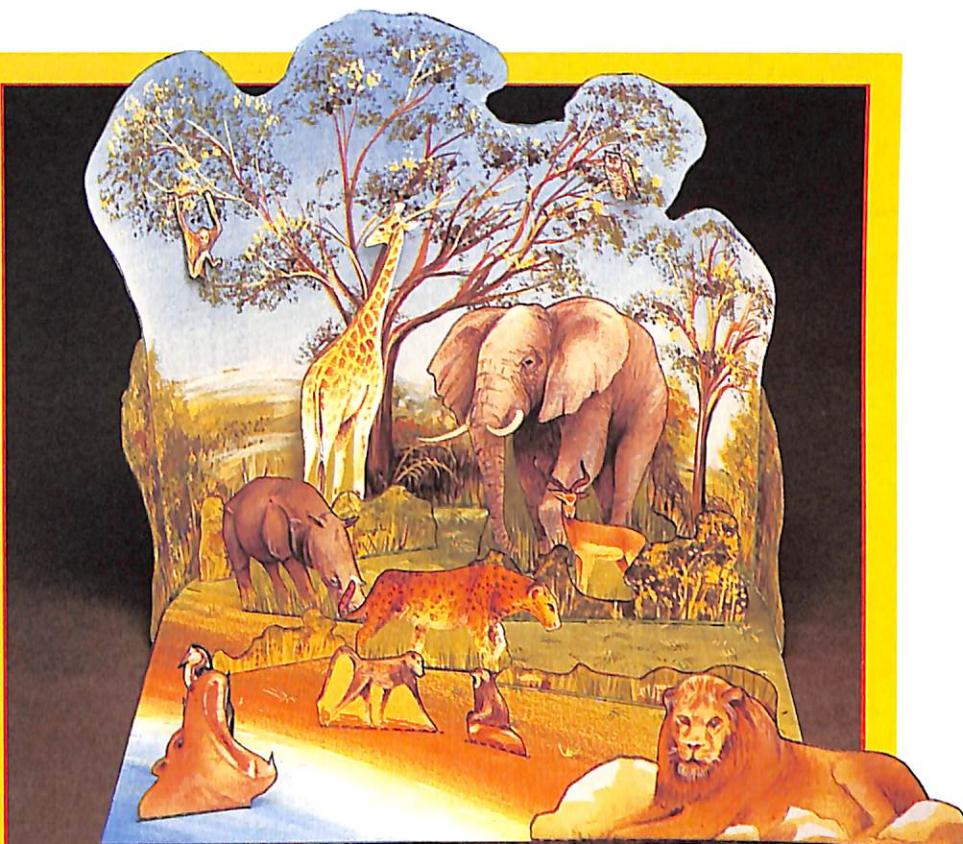
To make up

Vegetation

1 Cut out African grassland floor **A**, using craft knife to cut slits along unbroken lines.

2 Cut out backdrop **B**. Find short solid line on right-hand branch of largest tree and cut slit along line with craft knife. Fold all tabs forward, spread glue on upper side of tabs and stick tabs to underside of **A**, following two positioning marks on **A** (see ASSEMBLY DIAGRAM).

3 To complete backdrop, cut out bushes **C** and **D**. Fold tabs on **C** forward and glue to **A** and **B**. Repeat with **D**.



SAVANNAH WATER-HOLE

Animals

NB Follow ASSEMBLY DIAGRAM when matching animal or vegetation with appropriate slit in base **A**.

1 Cut out giraffe **E**, spread glue on upper side of folded back flap, push flap through slit in **A** and stick down, so that giraffe is fixed in position.

2 Repeat with grass and bushes **F** (in front of giraffe), elephant **G**, rhinoceros **H**, impala **I**, bushes and grass **J** and **K**, leopard **L**, monkeys **M** and **N** and grass **O**.

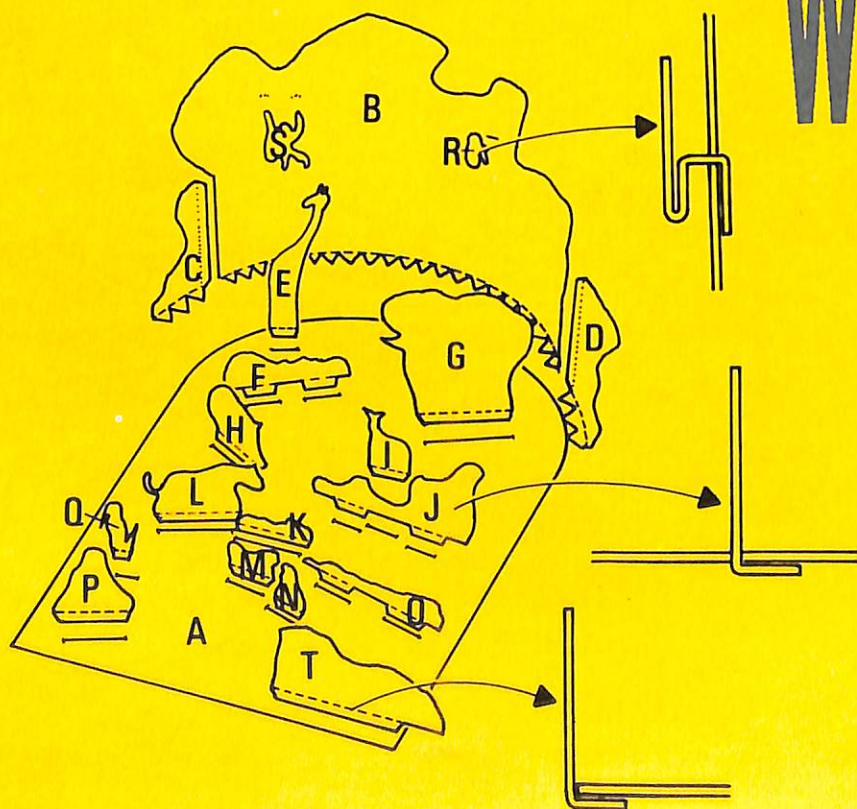
3 Cut out hippopotamus head **P** and slot flap through slit in water, as above. Repeat with heron **Q** on water's edge.

To finish

1 Cut out owl **R**, fold back tab (see ASSEMBLY DIAGRAM), slot tab into slit in **B** and stick down.

2 Cut out monkey **S**. Find positioning dots on left-hand branch of largest tree on **B**. Glue back of monkey's paws to marks, so that monkey is swinging from tree.

3 Cut out lion **T**, fold back flap and glue under front right-hand edge of **A**.



WHAT IS ON

THE GREENHOUSE EFFECT

GLOBAL WARMING

Carbon dioxide, and other gases emitted by industry and agriculture are enhancing the greenhouse effect and could cause a catastrophic rise in the temperature of our planet, according to scientists.

Power stations that burn fossil fuels – oil or coal – and petrol-powered cars give off carbon dioxide, a powerful 'greenhouse gas' that prevents heat being reradiated back into Space. Power stations also produce ozone. High in the atmosphere, this protects the Earth from ultra-violet radiation. Lower down, it is an efficient 'greenhouse' gas which traps infrared radiation, or heat, near to the Earth's surface.

Chlorofluorocarbons or CFCs – as well as destroying the radiation shielding ozone in the high atmosphere – are

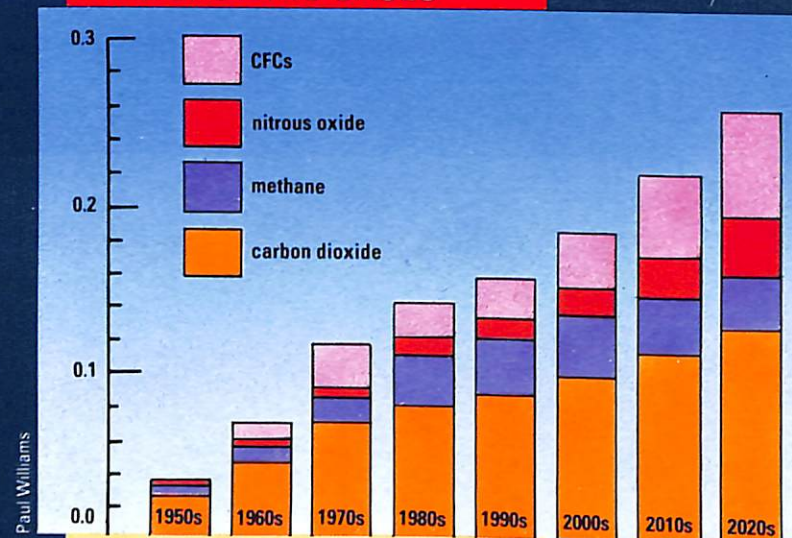
10,000 times more effective at trapping heat than carbon dioxide. They are used in cleaning fluids, as propellants in some aerosol cans, the coolant in refrigerators and as raw materials in making plastic foam.

Decaying organic matter in the stomachs of cattle and termites, rubbish in landfills and the burning of wood produces methane. Another greenhouse gas, nitrous oxide, is emitted mainly by nitrogen-based fertilizers.

All these gases are contributing to global warming and scientists believe that, unless something is done about their emission soon, the Earth's climate will be altered irrevocably. Drastic measures are now called for to restrict the output of greenhouse gases – before it is too late.

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THE GROWING GASES



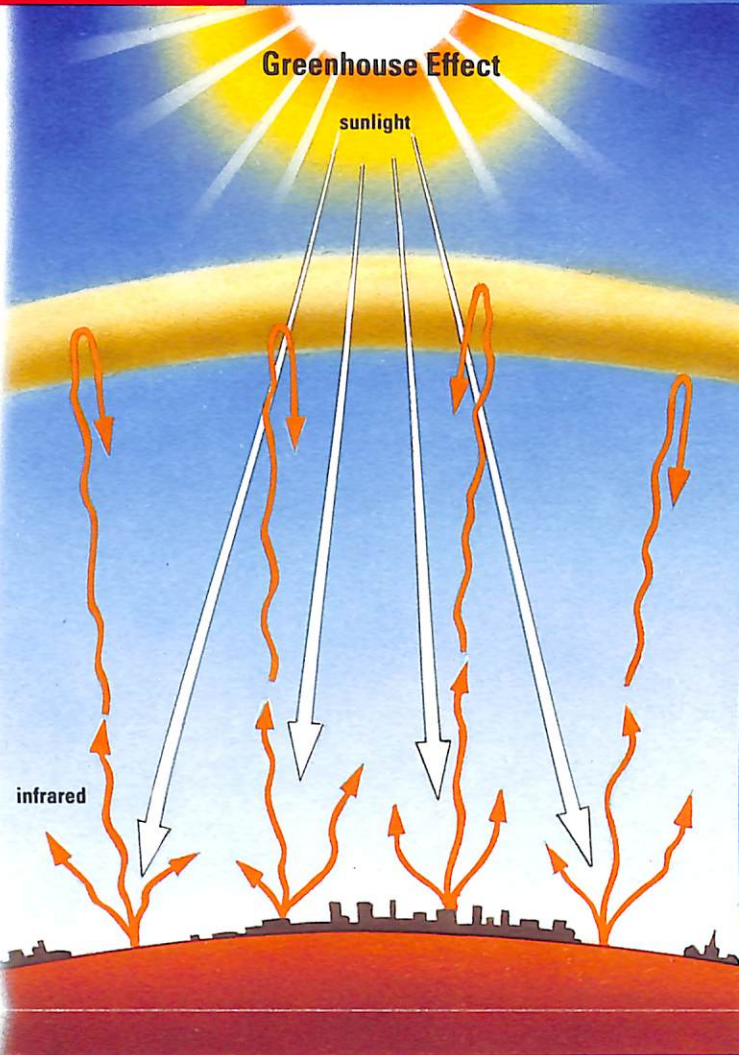
More and more greenhouse gases are being pumped into the atmosphere every year. This graph shows the fractions of global warming produced by various gases. From the time humankind discovered fire, additional carbon dioxide has been pumped into the air. Since the industrial revolution last century, then the invention of the motor car, this carbon dioxide emission has been accelerated. However, by 2010, CFCs, methane and nitrous oxide may cause just as much global warming.

QUEST



THE HEAT

HOW IT WORKS



It used to be thought that a greenhouse got hot because glass – while being transparent to visible light – was opaque to infrared radiation. So sunlight passed in through the glass roof and walls of a greenhouse.

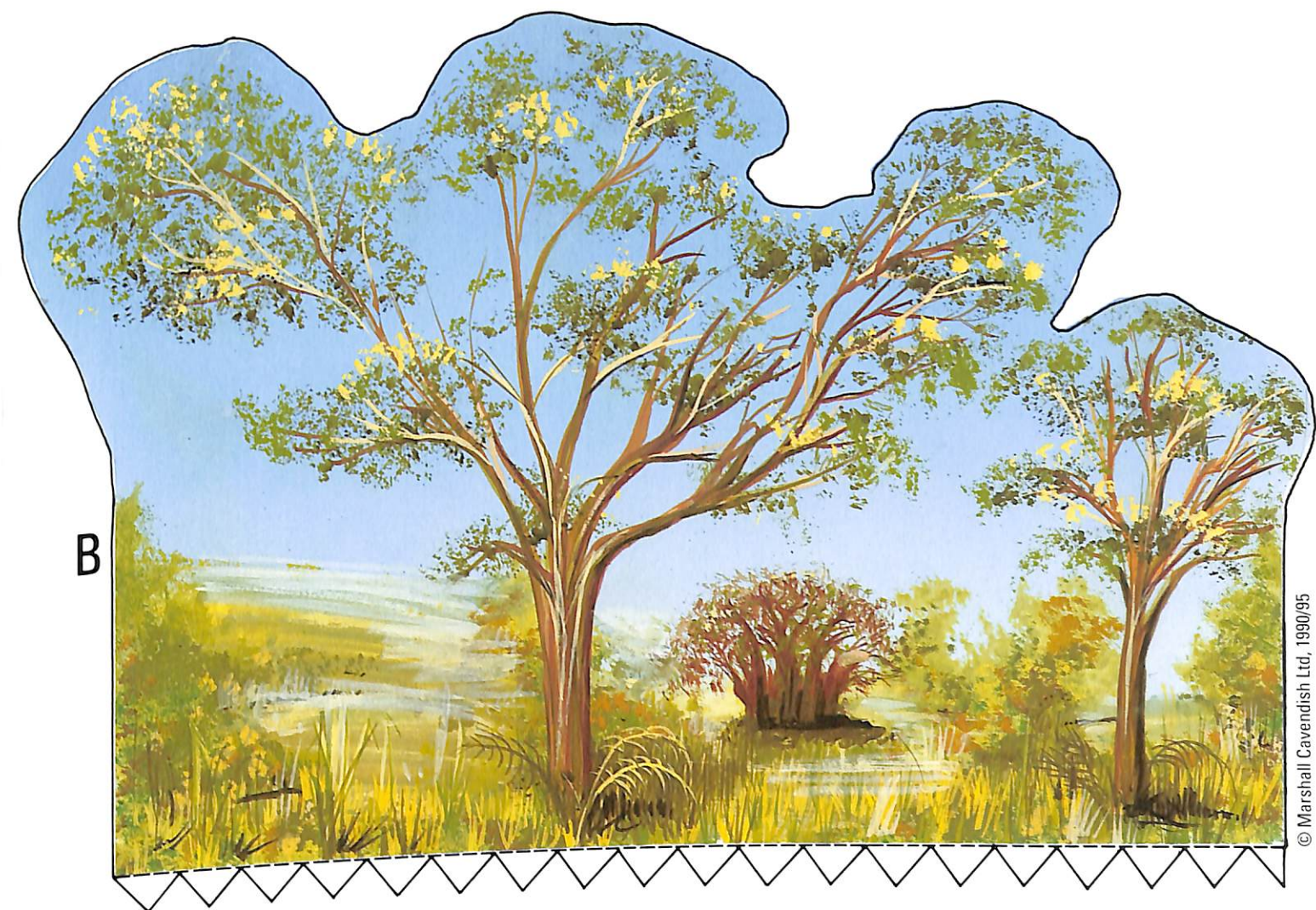
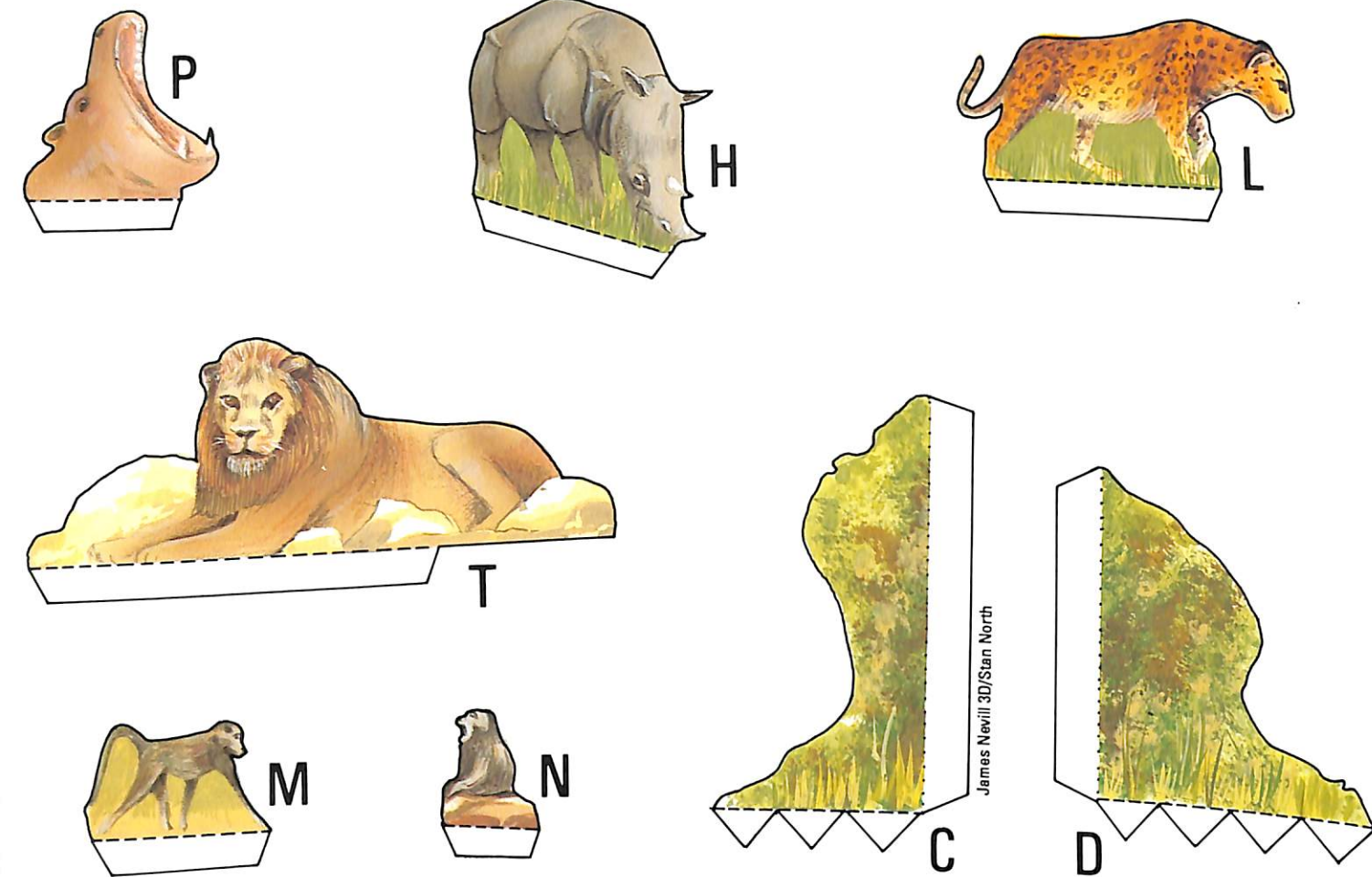
Inside the light was absorbed and the energy reradiated as infrared, or heat, which could not get out through the glass. This is called the greenhouse effect and is

how the atmosphere helps keep the Earth warm. Greenhouse gases pass visible light and block infrared, reflecting them back down to the surface of the Earth again, trapping the heat.

However, it has since been discovered that this is not how a greenhouse works at all. A greenhouse gets hot because it restricts heat lost back to the environment by convection.



One of the predicted consequences of global warming is mass flooding – the warm seas will expand and the ice caps melt.



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